



operator's manual

21" WALK-BEHIND MOWER

with Center Mounted Rear Bag

Push or Self-Propelled Unit



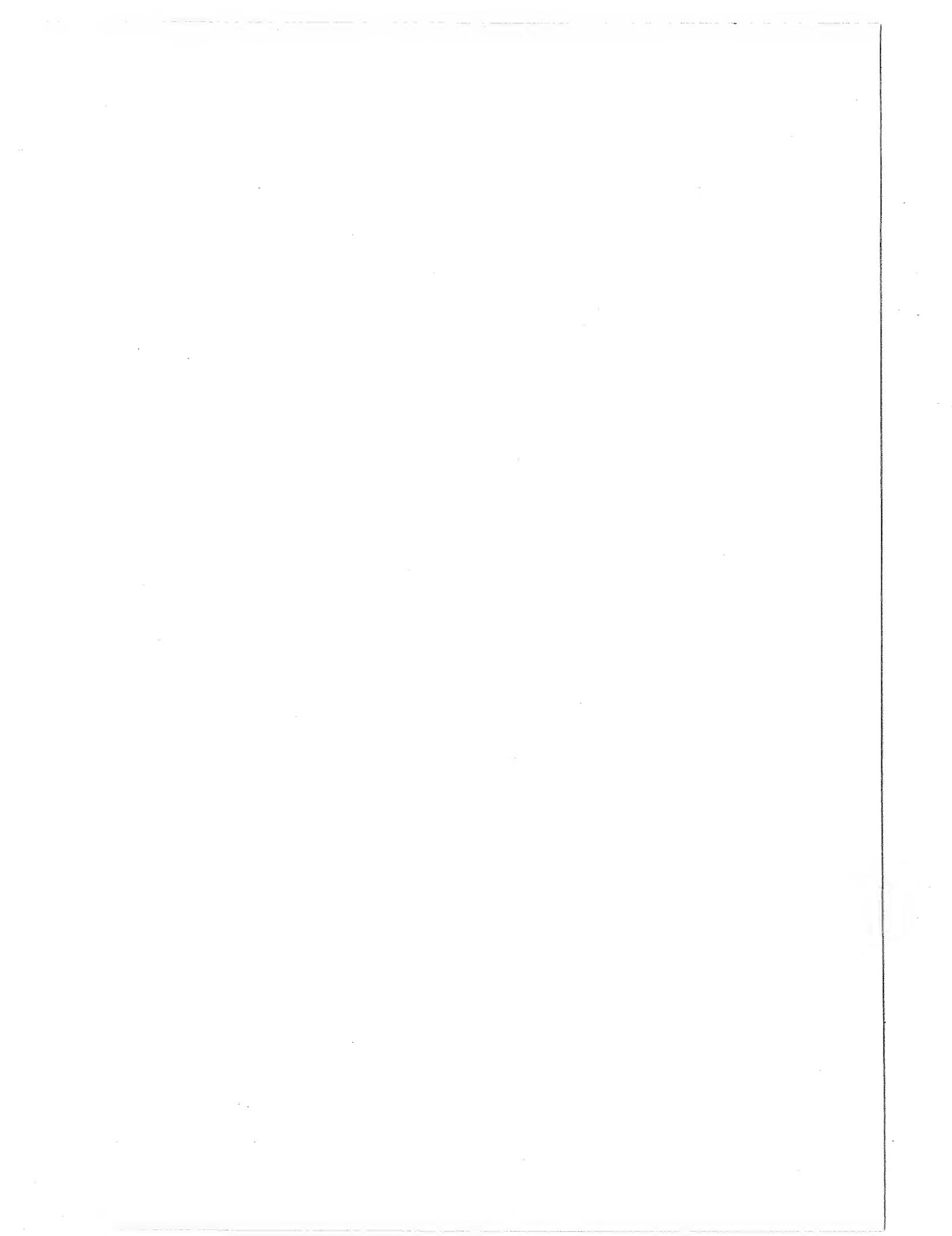
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Part No. 1667420
January, 1980



ALLIS-CHALMERS
LAWN & GARDEN EQUIPMENT

in U.S.A.



TO OUR DEALER

DEALER'S PREDELIVERY SERVICE GUIDE FOR 21" WALK BEHIND MOWER

PREOPERATIONAL CHECK

- Shipping Damage Corrected
- Engine Oil Level Checked

OIL LEAKS

- Check for Oil Leaks after Engine Warms Up

ENGINE

- Engine High and Low Idle Speeds Correct 1750
RPM Idle - 3400 RPM Full Throttle.
- Air Cleaner Elements Not Damaged and Properly
Installed.

GENERAL

- LUBRICATED
- Overall Appearance of Mower Checked
- Final Operational Check
- All Safety & Operational Decals in place
- Operator's Manual with Unit

DEALER'S DELIVERY GUIDE OF 21" WALK BEHIND MOWER

**EXPLAIN TO YOUR CUSTOMER THE CARE, SAFE OPERATION AND ADJUSTMENTS OF
ITEMS LISTED BELOW:**

- LUBRICATION
- ENGINE COOLING FINS
- ENGINE OIL
- PROPER FUEL
- STARTING & STOPPING

- AIR CLEANER
- USER'S RESPONSIBILITY AND WARRANTY
- STORING UNIT
- OPERATOR'S SAFETY PRECAUTIONS
- OPERATOR'S MANUAL

TO OUR CUSTOMER – USER'S RESPONSIBILITIES

TO OUR CUSTOMER

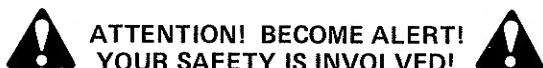
The following pages and illustrations are printed to help supply you with the knowledge to better operate and service your new ALLIS-CHALMERS equipment.

We are proud to have you as a customer and feel you will be proud to be an ALLIS-CHALMERS owner.

Any piece of equipment needs, and must have a certain amount of service and maintenance to keep it in top running condition. We have attempted to cover all the adjustments required to fit most conditions; however, there may be times when special care must be taken to fit a condition.

Study this operator's manual carefully and become acquainted with all the adjustments and operating procedures before attempting to operate your new equipment. Remember, it is a machine and has been designed and tested to do an efficient job in most operating conditions and will perform in relation to the services it receives.

If special attention is required for some conditions, ask your ALLIS-CHALMERS dealer; his Parts and Service Organization will be glad to help and answer any questions on operation and service of your new machine.



This symbol is used to call attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol - Heed Its Warning.

USER'S RESPONSIBILITY

It is the responsibility of the user to read the Operator's Manual and understand the safe and correct operating procedures as pertains to the operation of the product, and to lubricate and maintain the product according to the maintenance schedule in the Operator's Manual.

The user is responsible for inspecting his machine, and for having parts repaired or replaced when continued use of the product would cause damage or excessive wear to other parts. It is the user's responsibility to deliver his machine to an Allis-Chalmers dealer for service or replacement of defective parts which are covered by the standard warranty. When requesting warranty service, you must present your copy of delivery record.

The user will advise the Dealer when operation of the unit will be started so dealer representative can be on hand to make necessary adjustments and help you get started properly.

If the Dealer is requested by the Customer to travel to another location, or haul the machine to his shop for the purpose of performing a warranty obligation or free inspection, it would be for the Customer's convenience, and the cost for such trips is to be paid for by the Customer. Any arrangement whereby the Dealer agrees to absorb all or a part of the cost of these trips is to be made between the Dealer and the Customer and is to be considered a courtesy to the Customer.

Allis-Chalmers does not allow credit for the cost of travel time, mileage, or hauling as a warranty allowance.

WARRANTY . . . Your Allis-Chalmers warranty for any new equipment listed appears on your copy of the Purchase Order signed by you and your selling dealer. You will be required to pay any premium for overtime labor requested by you, any charge for making service calls and for transporting the equipment to and from the place where warranty work is performed. Normal maintenance service and repair work not covered by the warranty during the warranty period and all service after the warranty period will be charged for at the dealer's regular rates and prices.

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TAKE TIME FOR SAFETY

BE A SAFE OPERATOR

AVOID ACCIDENTS BY

THINKING BEFORE ACTING

AND BY READING YOUR OPERATOR'S MANUAL

NOTE: Some illustrations in this manual show units with optional equipment installed. This optional equipment may be purchased from your local Allis-Chalmers dealer.

NOTE: Some photographs in this manual were taken of prototype models. Production models may vary in some detail.



CAUTION: Some photographs in this manual may show shields or cover panels removed for purposes of clarity. NEVER OPERATE Unit without all shields and cover panels in place.



SAFETY PRECAUTIONS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

This symbol is used to call your attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol -- Heed Its Warning.

PROTECT YOURSELF AND OTHERS BY FOLLOWING THESE SAFETY RULES

GENERAL

- Read the Operator's Manual carefully. Be thoroughly familiar with the controls and proper use of the equipment.
- Use only attachments or accessories designed for your mower. See your dealer for a complete list of approved attachments or accessories.
- Never allow children to operate the mower.
- Keep the area of operation clear of all persons, particularly small children, and pets.

PREPARATION

- Thoroughly inspect the area where the mower is to be used and remove all stones, sticks, wire, bones and other foreign objects.
- Do not operate mower when barefoot or wearing open sandals. Always wear substantial footwear.
- Never operate mower in wet grass. Always be sure of your footing; keep a firm hold on handle and walk, never run.
- Do not engage self-propelling drive (if equipped) while starting the engine.
- Never attempt to make a wheel height adjustment while engine is running.
- Mow only in daylight or in good artificial light.
- Handle gasoline with care - it is highly flammable.
 - a. Use approved gasoline container.
 - b. Never remove the cap of the fuel tank or add gasoline to a running or hot engine. Never fill the fuel tank indoors. Wipe up spilled gasoline.
 - c. Use a funnel when filling tank.
- Do not run the engine indoors. Exhaust fumes are deadly.

OPERATION

- Do not put hands or feet near or under rotating parts. Keep clear of discharge opening at all times.
- Stop engine when crossing gravel drive, walks or roads.
- Be especially careful not to touch mower or attachment parts which might be hot. Allow such parts to cool before attempting to maintain, adjust or service.
- After striking a foreign object, stop the mower, remove spark plug wire and fasten it away from the plug. Thoroughly inspect the mower for any damage, and repair the damage before restarting and operating the mower.
- Do not change engine governor settings or overspeed engine.
- If the mower should start to vibrate abnormally, stop the engine and check immediately for the cause. Vibration is generally a warning of trouble.
- Stop engine before you leave the equipment, before cleaning the mower housing, and before making any repair or inspection.
- When cleaning, repairing or inspecting, make certain blade and all other moving parts have stopped. Disconnect spark plug wire and fasten wire away from plug to prevent accidental starting.
- Stop engine and wait until blade comes to a complete stop before removing grass catcher and/or unclogging chute.
- Mow across the face of slopes, never up-and-down. Exercise extreme caution when changing direction on slopes. Do not mow excessively steep slopes.
- Never operate mower without proper guards, plates or other safety protective devices in place.

MAINTENANCE & STORAGE

- Never store mower with gasoline in the tank inside of a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.

SAFETY

- Check blade and engine mounting bolts at frequent intervals for proper tightness.
- Keep all nuts, bolts, and screws tight to be sure equipment is in safe working condition.
- To reduce fire hazard keep engine free of grass, leaves or excessive grease.
- Check grass catcher bag frequently for wear or deterioration. Replace with new bag for safe operation.
- To avoid gasoline spills, empty the tank before tipping up to work under mower.

SAFETY AND OPERATIONAL DECALS

These Safety Decals should be kept clean and in good condition to provide operator with constant reminders of safe operating procedures. If they become damaged or destroyed, replace them immediately. New decals can be obtained from your Allis-Chalmers Dealer.

All DANGER, CAUTION, and other instructional messages on this unit should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety, and it is important.

CAUTION

BEFORE SERVICING BLADE

1. STOP ENGINE.
2. DISCONNECT PLUG WIRE & GROUND TO ENGINE.

LIFT THIS SIDE

DANGER

KEEP HANDS and FEET AWAY



keep hands & feet from under machine

CAUTION

place foot here
when starting



DANGER

HOT SURFACES

CAUTION

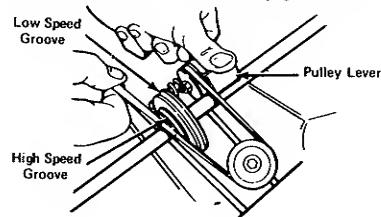
do not use machine
without bag or cover plate.

CAUTION

1. Stop engine before any speed adjustment.
2. Avoid touching hot muffler by working from discharge chute side. (See illustration)

TO CHANGE SPEED

1. Push pulley lever forward and pull all belt slack toward the double groove pulley. (See illustration)
2. Place belt in desired speed groove.
3. Release pulley lever and check to see that belt is properly seated in all pulley grooves.



DISENGAGE

ENGAGE

SPECIFICATIONS

ENGINE

Make: Briggs & Stratton - 4 cycle, air cooled
Model (Push): 92908
Model (Self-propelled): 92998
Cylinder: 1 Horizontal
Bore & Stroke: 2-9/16" x 1-3/4" (65.09 mm x 44.45 mm)
Displacement: 9.02 cu. in. (147.8 cc)
Governor: Air Vane
Oil Capacity: 1-1/4 pints (0.6 liters)
Ignition: High tension magneto
Air Cleaner: Oil foam
Fuel Tank Capacity: 1 quart (0.95 liters)
Choke: Automatic with purge position
Starter: Manual - geared rewind, vertical pull

			Robert
Spark Plug Type:	Champion	Autolite	Bosch
Short Plug:	CJ-8	235	WS9E
Long Plug:	J-8	295	---
Resistor Short Plug:	RCJ-8	245	---
Resistor Long Plug:	RJ-8	306	---
Spark Plug Gap:	0.030" (0.76 mm)		
Ignition Point Gap:	0.020" (0.51 mm)		
Intake Valve Clearance:	0.005" - 0.007" (0.13 - 0.18 mm)		
Exhaust Valve Clearance:	0.009" - 0.011" (0.23 - 0.28 mm)		

MOWER HOUSING

Material- Die cast aluminum
Discharge Location: Right front corner
Grass Catcher Location: Top right side of deck

WHEELS

Front Wheels: 6" (152.4 mm) - high density plastic
Rear Wheels (Push): 10" (254 mm) - high density plastic
Rear Wheels (Self-propelled): 10" (254 mm) - steel with ball bearings

HEIGHT ADJUSTERS

Cutting Height: 1" to 3" (25.4 to 76.2 mm)
Positions: 6

HANDLE

Height: Adjustable to 2 positions
Storage: Folds over engine

MOWING OPTIONS

Side Discharge, mulching, or rear grass catcher

MOWER DRIVE (Self-propelled)

Rear - Wheel Drive: High speed - 2.72 mph (4.4 Km/h) at 3400 rpm engine speed
Low Speed - 2.24 mph (3.6 Km/h)

Drive: Friction roller with touch-a-matic control clutch

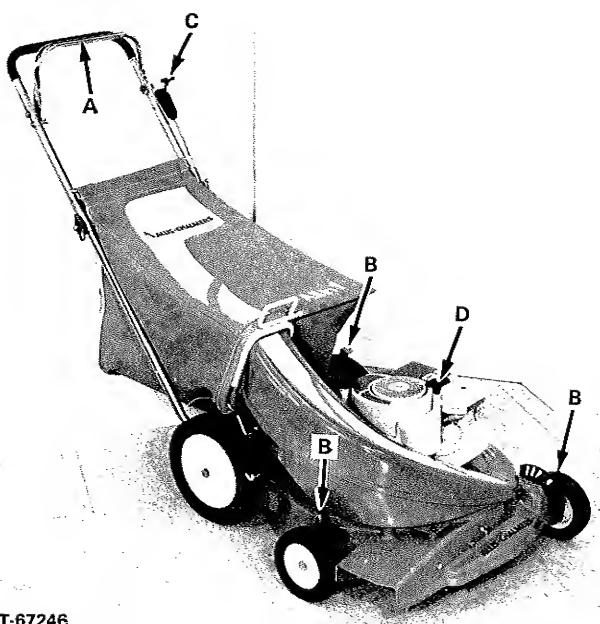
DIMENSIONS

Length (high handle position) 57-1/2" (1460 mm)
Width: 25" (635 mm)
Height (high handle position): 39-1/2" (1003 mm) at 3" (76.2 mm) cutting height
Height (low handle position): 35-1/4" (895 mm) at 3" (76.2 mm) cutting height

SAFETY MEANS . . .

- USE YOUR HEAD to keep yourself and others safe!
- KNOW and FOLLOW the safety rules and procedures for the job at hand — Shortcuts lead to accidents.
- THINK about the job you are doing at all times! Routine work does not mean routine thinking.
- BE ALERT to potential danger situations — Correct them yourself or have them corrected.
- THE ONLY WAY IS THE SAFE WAY — Use your eyes to find safety hazards before they find you.

OPERATION



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FIGURE 1 - MOWER CONTROLS

CONTROLS

Refer to Figure 1 for an explanation of mower controls.

CHECKS BEFORE STARTING

1. Be sure all safety guards are in place and that all nuts, bolts and spring clips are secure.
2. Be sure the mower is set to desired height (See Adjustment Section).
3. Check the engine oil level.
4. Refer to the Normal Care section of this manual to perform any needed care for the mower.
5. Prepare the mower for type of lawn care desired. See Attachment Installation section.



WARNING: Do not add gasoline when engine is hot or running. Add gasoline with mower on level surface. Use a funnel. Wipe up any spills.

6. Check the gasoline supply. Use clean, fresh, low-lead or lead-free regular grade gasoline. Do not mix oil with gasoline.
7. On self-propelled models, select one of the two available forward speeds. See Mower Belt Adjustment in Adjustments section.

NOTE: Before operating for the first time, be sure mower has been set up according to the "Walk Behind Mower Setup Instructions" shipped with the mower.

STARTING & STOPPING



WARNING: Accidents can result from the operator slipping when mowing up and down the face of slopes. Always mow across the face of slopes, never up and down. Do not attempt to mow excessively steep slopes, and always exercise extreme caution when changing direction on any slope. Do not mow on slopes when the grass is wet and slippery. On self-propelled models, use the slow drive speed on slopes.

ITEM	NAME	FUNCTION
A	Touch-a-matic Control Bar (Self-propelled models only)	Engages the rear driving wheels when pulled back; Disengages the rear driving wheels when released.
B	Height Adjusters	Control the mower cutting height.
C	Engine Speed Control Lever	Controls the engine speed and engine shut off.
D	Rewind Starter	Pull to start engine.

1. Place the mower on a flat surface such as a sidewalk. Do not attempt to start in tall grass.
2. Set the engine speed control to START.



WARNING: Keep hands and feet from under mower deck at all times during starting and operation.

3. Place one foot on the mower deck where "place foot here when starting" is embossed on the mower. Keep your other foot well away from the mower. Grasp the start handle and pull upward with a smooth motion. Return the handle slowly to the cover by hand. Do not release handle with the rope extended.
4. If engine doesn't start, refer to Service Tips section in this manual.
5. Allow the engine to warm up for about one minute before mowing.
6. Engine speed should be set at maximum speed for best performance.

OPERATION

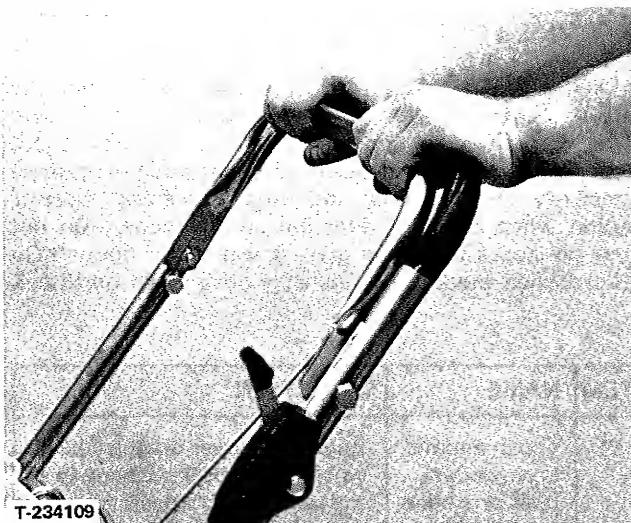


FIGURE 2 - ENGAGING CONTROL BAR

7. On self-propelled models, squeeze the control bar toward the handle. Hold the control bar against the handle bar while mowing. See Figure 2. For trimming, the mower may be pushed forward manually, using only the mower handle.
8. To stop forward motion of self-propelled models, release the control bar.
9. To stop the engine, move the speed control lever to STOP position.
10. Clean grass and dirt from the mower, especially from the muffler area. Don't touch muffler or engine when hot.
11. The handle can be lowered to save storage space. Fold the handle forward, squeezing the lower handle together to clear the stops. Loosen the two wing nuts and fold the upper handle down. Be careful not to damage the control cable (self-propelled models). To raise the handle, pivot the handle back to its normal position. Tighten the wing nuts.

ATTACHMENT INSTALLATION



WARNING: For your personal safety, never operate mower without grass catcher or deck plate installed.

Installing the Grass Bag

1. If the deck plate (B, figure 3) is installed remove it by unscrewing the wing screw (A). Slide out the deck plate from under the two spring bolts (C). Figure 3.
2. Install the baffle plate (A) as shown in figure 4. Slide the slot (B) under the spring bolt (E). Screw the wing screw (C) thru the mower deck and speed nut (D). (The speed nut is attached to the baffle plate.)

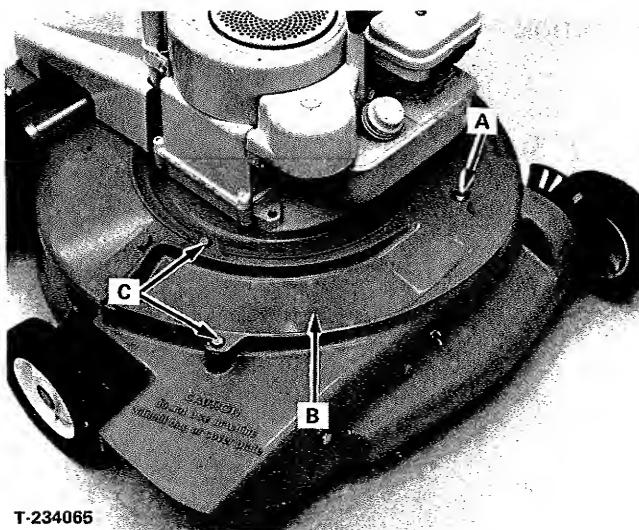


FIGURE 3 - DECK PLATE

- A. Wing Screw
- B. Deck Plate
- C. Spring Bolts

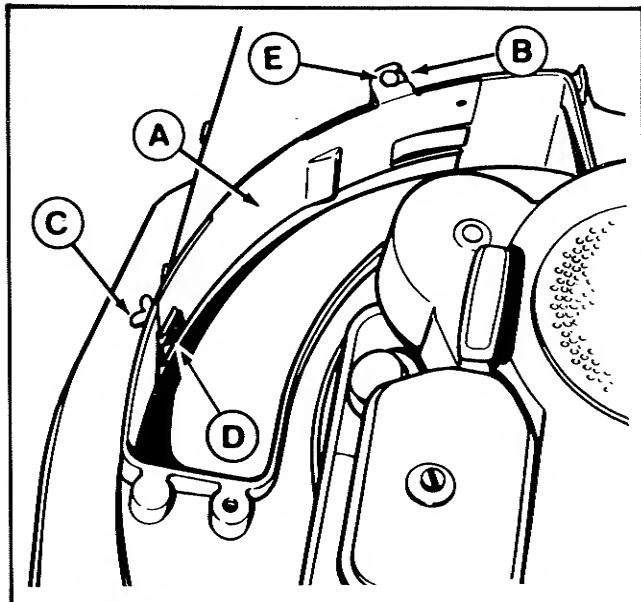


FIGURE 4 - BAFFLE PLATE

A. Baffle Plate	D. Speed Nut
B. Slot (in baffle plate)	E. Spring Bolt
C. Wing Screw	

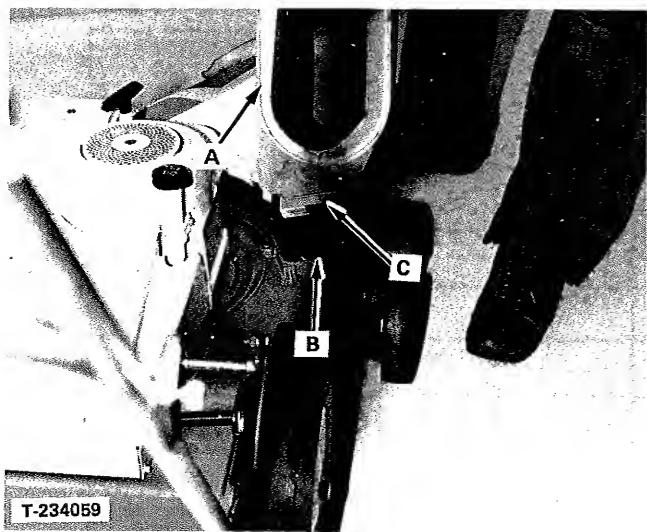


FIGURE 5 - GRASS CHUTE

- A. Grass Chute
- B. Hook
- C. Rear Edge of Opening

3. To install the grass chute (A, Figure 5) align the hook (B) with rear edge of housing and slide the chute onto the opening. Install the two wing screws (A, Figure 6) to secure the chute to the mower deck.
4. Install the grass bag as shown in Figure 7. Hook the rear hanger (A) onto the cross bar. Slide the front hanger down onto the grass chute.

Emptying the Grass Bag



WARNING: For your personal safety, be sure engine is stopped and all moving parts have stopped before removing the grass bag.

Grasp the front and rear hangers and pull up off the mower. Empty the bag. Be sure the bag is securely installed on the mower before starting the engine.

Installing The Mulcher

For mulching operation, only the baffle plate and deck plate must be installed.

1. Remove the grass bag and grass chute if installed.
2. Remove the deck plate in order to install the baffle plate. See Figure 4. Install the baffle plate.
3. Reinstall the deck plate by sliding the two slots under the spring bolts. Install the wing screw (A, Figure 3).

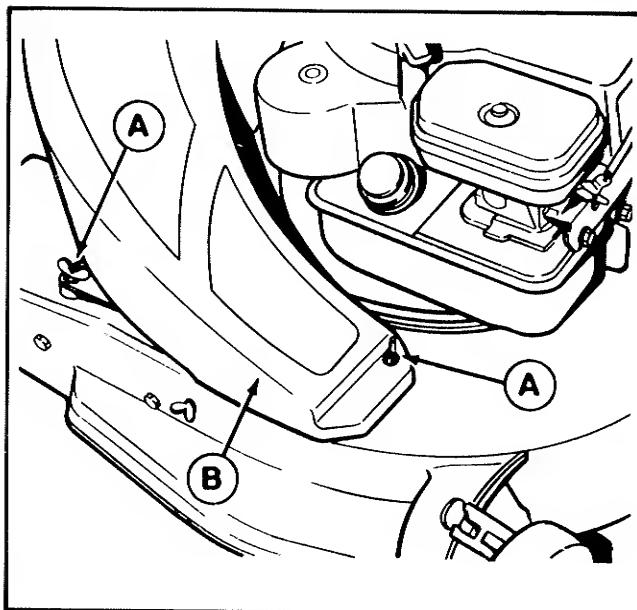


FIGURE 6 - GRASS CHUTE INSTALLED

- A. Wing Screw
- B. Grass Chute



FIGURE 7 - GRASS BAG

- A. Rear Hanger
- B. Grass Bag
- C. Front Hanger

Side Discharge Installation

1. Remove the grass bag, grass chute and baffle plate.
2. Install only the deck plate (B, Figure 3) for side discharge.

NORMAL CARE

Care Required	TIME INTERVALS						
	After Each Use	Before Each Use	Every Five Hours	Every 25 Hours	Every 50 Hours	Yearly or Every 100 Hours	Every 100 to 300 Hours
Clean Mower	•						
Check Oil Level		•	•				
Lubricate Mower				•			
Clean/Sharpen Blade				•			
Change Oil				•*			
Service Air Cleaner				•**			
Clean Cooling System						•	
Service Spark Plug						•	
Remove Carbon							•

* Change oil after first five hours of operation.
** Or every three months. More often in dusty conditions.

Table 1. Schedule of Normal Care

NORMAL CARE

WARNING: For your personal safety, disconnect spark plug wire and fasten it away from the plug before tipping mower to work underneath. This will prevent accidental starting.

SCHEDULE OF NORMAL CARE

Perform care listed in Table 1 at the indicated time intervals. To determine operating time, multiply the time it takes to do one job by the number of times you've done the job.

CLEAN THE MOWER

WARNING: To avoid gasoline spills, tip the mower only when the fuel tank is empty. To avoid burns, allow mower to cool.

After each use, clean all dirt and grass from underside of mower, discharge chute, grass bag, and top side of mower (especially muffler area). Tip mower as directed on decal "Lift This Side" (spark plug side up).

If the engine is tipped with spark plug side down, oil will run into the cylinder.

CHECK OIL LEVEL

1. Place the mower on a level surface. Clean the area around the dipstick (B, Figure 8).

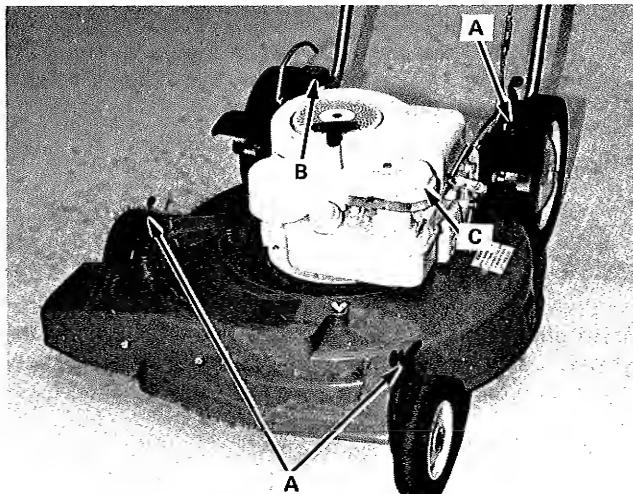


FIGURE 8 - LUBRICATE HEIGHT ADJUSTERS

- A. Lubrication Points
- B. Oil Fill Tube/Dipstick
- C. Air Cleaner

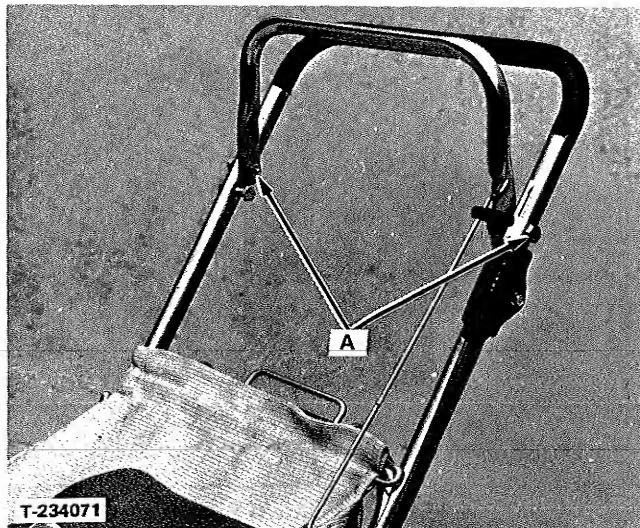


FIGURE 9 - CONTROL HANDLE PIVOT POINT LUBRICATION

A. Lubrication Points

2. Remove the dipstick and wipe clean. Screw dipstick on firmly but slowly until cap bottoms on tube. Remove dipstick and check level.
3. Fill to FULL mark on dipstick. Pour slowly. The oil capacity is 1-1/4 pints (0.6 liters). Do not overfill. The dipstick must be securely assembled into tube at all times when the engine is running.

LUBRICATE MOWER

Every 25 hours and at the end of the mowing season, apply a few drops of oil as shown in Figures 8, 9 and 10.

CLEAN OR SHARPEN BLADE



WARNING: For your safety, use extreme care when handling the blade. Careless or improper handling could result in serious injury.



WARNING: To avoid gasoline spills, perform this procedure when the tank is empty. To avoid burns, allow mower to cool.

1. Disconnect the spark plug wire and fasten it away from the plug.
2. Tip the mower up (spark plug side up).
3. Use a wooden block to restrict the blade from rotating. Wedge it between the blade and the housing so the blade cannot turn counterclockwise.

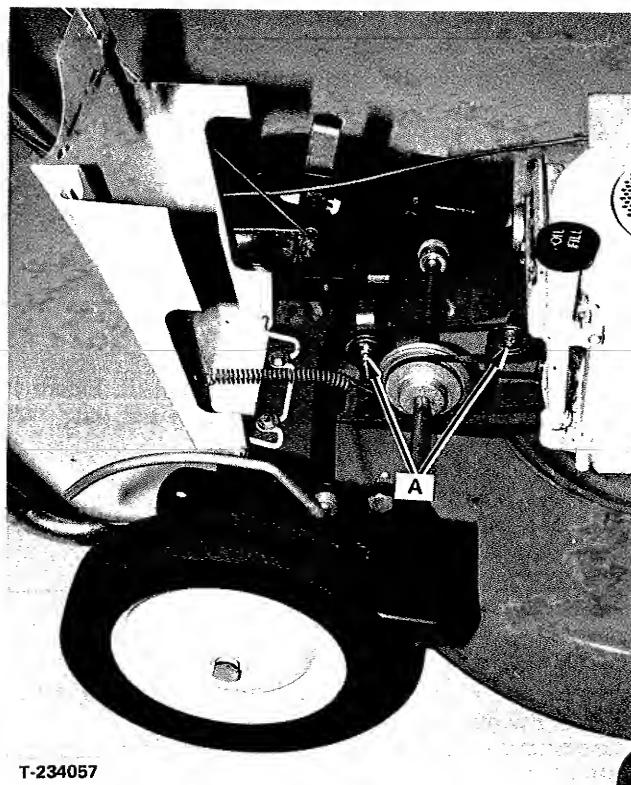


FIGURE 10 - PULLEY BEARING LUBRICATION

A. Lubrication Points.

Keep oil off belt and pulley grooves.

4. Use a box-end wrench to remove the blade mounting screw.
5. Use a file to sharpen the blade along the original bevel. Remove all nicks and dents in the blade edge. If the blade is severely damaged, it should be replaced.
6. Check the blade balance. Hammer a thin finishing nail horizontally into the side of work bench or other vertical surface. Lubricate the nail with a drop of oil.
7. Center the blade's center hole on the nail. Do not let the blade touch the bench. A balanced blade will remain level.
8. File material off heavier end of blade until it is balanced.
9. Install the blade, washer and screw. Install the blade with tabs pointing up. See Figure 12B.
10. Wedge a wooden block between the blade and the housing so the blade cannot turn clockwise.
11. Torque the screw to 45-50 ft. lbs. (60-68 N.m)

NORMAL CARE

CHANGE OIL



WARNING: Disconnect the spark plug and fasten it away from the engine to avoid accidental starting.

1. Change oil while engine is warm. See Table 2 for correct oil viscosity. Use a high quality detergent oil classified "For Service SC, SD, SE or MS". Detergent oils keep the engine cleaner and retard the formation of deposits. Nothing should be added to the oil.
2. The oil may be drained thru oil drain (C, Figure 13) on bottom of engine by removing the plug. The engine must be level.
3. See Check Oil Level to add oil. Capacity is 1-1/4 pints (0.6 liters).

Below 20°F (-6°C)

5W-20, 5W-30
(if not available, use synthetic oil - 5W-20, 5W-30, or 5W-40).

0°F to 60°F (-18°C to 16°C)

10W-30, 10W-40

Above 40°F (5°C)

30, 10W-30, 10W-40

Table 2. Oil Selection Chart

SERVICE THE AIR CLEANER

1. The air cleaner is shown in Figure 11. Remove the air cleaner carefully to prevent dirt from entering the carburetor. To remove the air cleaner remove the screw from cover.
2. Notice the position of the cup and foam element in the body. Take the air cleaner apart. Wash the foam element in a liquid detergent and water to remove dirt. Wrap the element in a cloth and squeeze dry. Saturate the foam element with engine oil. Squeeze to remove excess oil.
3. Install the cup and element back into the body in original position. See Figure 11. Install element so lip extends over edge of air cleaner body. The lip will form protective seal when cover is installed.
4. Place the cover on the air cleaner and fasten to carburetor with the screw.

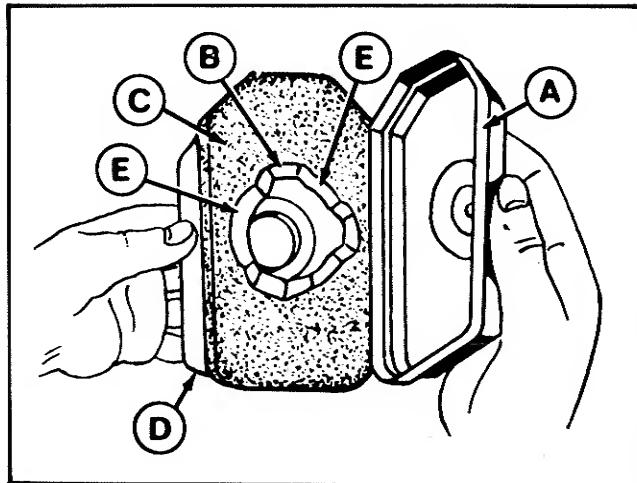


FIGURE 11 - AIR CLEANER

- A. Cover
- B. Cup
- C. Foam Element
- D. Body
- E. Assemble one of the low points toward narrow edge of element.

CLEAN THE COOLING SYSTEM

1. To remove the blower housing, first remove two screws (B, Figure 12) which attach cover (C) to engine. Remove the three screws (A, Figures 12 and 12A). Lift housing to remove.

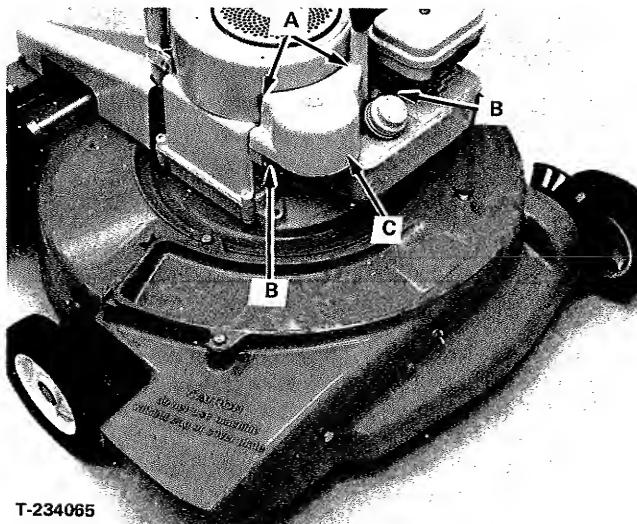


FIGURE 12 - REMOVING THE BLOWER HOUSING

- A. Screws (under cover)
- B. Screws
- C. Cover

NORMAL CARE

2. Remove grass, dirt and chaff from engine, especially from the rotating screen. See details in the engine manual.

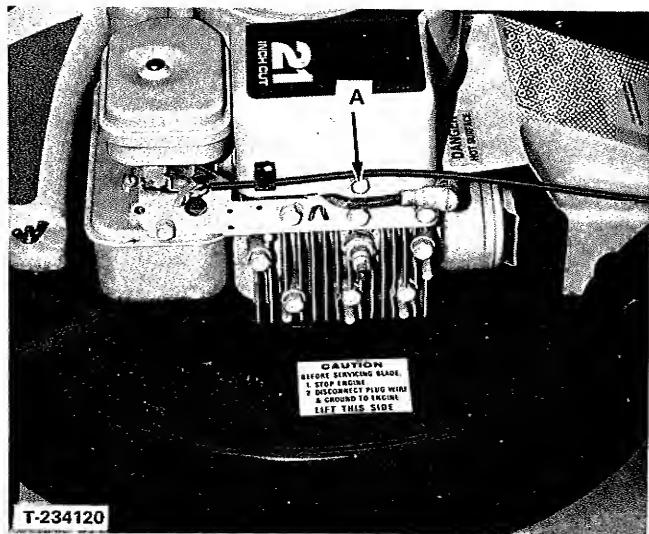


FIGURE 12A - REMOVING THE BLOWER

A. Screw

SERVICE THE SPARK PLUG

Clean and reset gap at 0.030 inch every 100 hours of operation. Clean spark plug by scraping or wire brushing and washing with a commercial solvent. Do not blast clean the plug. Spark plug wire must firmly engage post to prevent sparking.

REMOVE CARBON DEPOSITS

Every 100 to 300 hours of operation, carbon should be removed from the combustion chamber, top of piston and around valves. See your dealer.

OFF-SEASON STORAGE

1. Drain the fuel tank completely by running the engine until it stops. The small amount of fuel that remains in the tank should be removed by absorbing it with a clean, dry cloth. This will prevent the formation of gum deposits.
2. Change engine oil (unless done recently).
3. Remove the spark plug, pour 1 oz. (30 ml) of 10W-30 oil into the cylinder through the plug hole. Crank engine a few times to distribute oil. Reinstall the plug.
4. Clean the cooling system.
5. Store in a clean, dry area.

STARTING AFTER STORAGE

1. Remove the spark plug and wipe dry. Crank the engine several times to blow excess oil out of plug hole. Reinstall the plug.
2. Fill the fuel tank with fresh gasoline.
3. Start the engine outdoors. Do not run the engine at high speeds immediately after starting.

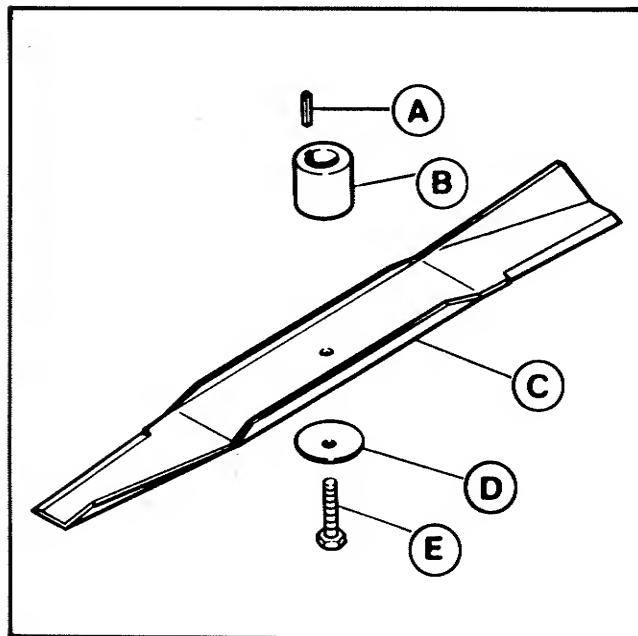


FIGURE 12B - BLADE MOUNTING HARDWARE

- A. Key
- B. Adaptor
- C. Blade
- D. Washer (install concave side up)
- E. Capscrew

SERVICE TIPS

SERVICE TIPS



WARNING: Before working on the mower, disconnect the spark plug wire and fasten it away from the plug.

1. Engine will not start.

- A. No fuel in the tank. Refill the tank.
- B. Engine speed control not on START: Re-position.
- C. Spark plug wire not connected, reconnect.
- D. Engine flooded. Move speed control lever to STOP. Crank the engine six times by pulling starter rope. Then attempt to start engine with speed control on START.

2. Mower will not drive (Self-propelled models only).

- A. Wheels packed with grass. Clean the wheels.
- B. Drive rollers slipping at the tires. Adjust the drive mechanism (see Adjustment section).
- C. Drive belt slipping. Check belt and pulleys.
- D. Drive belt broken. Replace with proper belt. See Belt Replacement.

3. Mower cut uneven.

- A. Wheels not leveled properly. Check wheel adjustments.

- B. Mower Blade dull. Check/resharpen.

4. Mower vibrates excessively.

- A. Blade mounting screw is loose. Tighten to 45 - 50 ft. lbs. (60 to 68 N·m).

- B. Blade out of balance. Check balance.

5. Engine RPM drops while mowing.

- A. More engine power needed to cut grass. Increase engine speed.

- B. Grass is too tall or thick. Raise mower using height adjusters. Mow again (if desired) with height adjusters lower.

- C. Ground speed too fast. On push models, proceed slower. On self-propelled models, place belt on slower drive pulley (see Mower Belt Adjustment in Adjustments section).

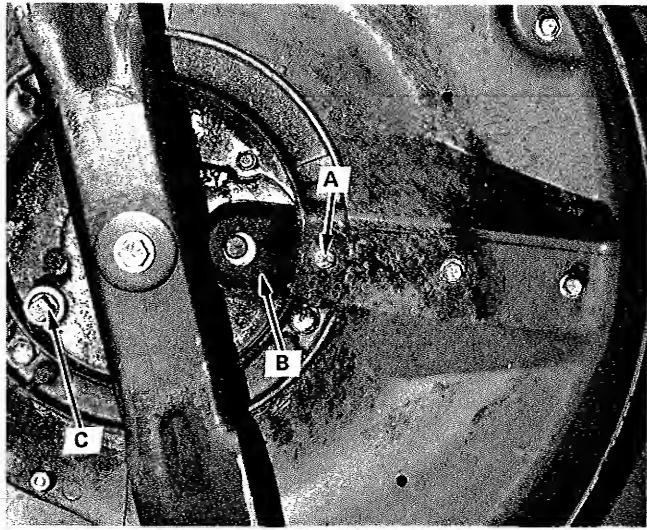


FIGURE 13 - BELT SHIELD

- A. Capscrew
- B. Belt Shield
- C. Oil Drain

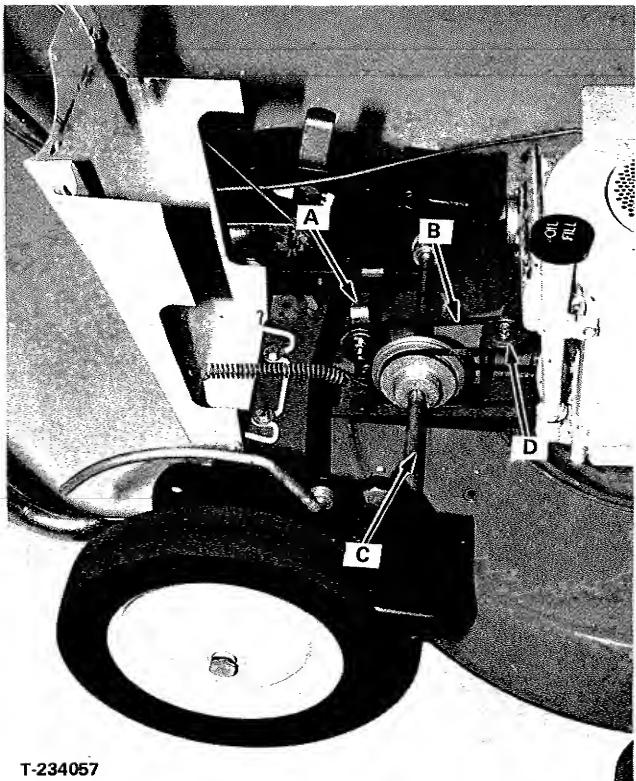


FIGURE 14 - BELT INSTALLED ON PULLEYS

- A. Idler Pulley Arm
- B. Belt
- C. Shaft
- D. Horizontal Pulley

BELT REPLACEMENT (SELF-PROPELLED MODELS ONLY)



WARNING: Disconnect the spark plug wire and fasten it away from the spark plug.

1. Lift mower up from the spark plug side as directed on decal. Remove capscrew (A, Figure 13) holding on the belt shield (B).
2. Push the spring loaded vertical idler pulley arm (A, Figure 14) forward and slip the old belt up off the horizontal pulley (D). Figure 14.
3. Slide belt shield out toward the mower blade.
4. Slip the old belt off the engine drive pulley and remove it from the mower deck.
5. Insert new belt through mower deck opening. Place belt onto engine drive pulley, making sure that it is seated properly in the pulley groove.
6. Keep tension on the belt while tipping the mower back on its wheels so that the belt does not slip from mower drive pulley.
7. Run the belt under the shaft pulley (C) and idler pulley (A), then around to the top horizontal pulley (D). Make certain that the belt is properly installed as in Figure 14. See belt pattern in Figure 15.

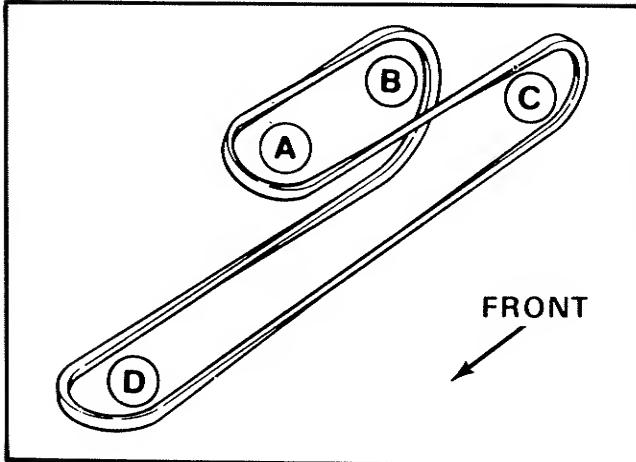


FIGURE 15 - BELT PATTERN

- A. Horizontal Pulley
- B. Shaft Pulley
- C. Spring Loaded Idler Pulley
- D. Engine Drive Pulley

8. Tip the mower back up from the proper side. Checking that the drive belt is properly seated in the drive pulley groove. Replace the belt shield and capscrew.
9. Check to be sure that the belt is seated properly in all pulley grooves.
10. Replace spark plug wire.

ADJUSTMENTS

ADJUSTMENTS

WARNING: Before making any adjustments, stop the engine and wait for all moving parts to stop. Disconnect the spark plug wire and fasten it away from the plug.

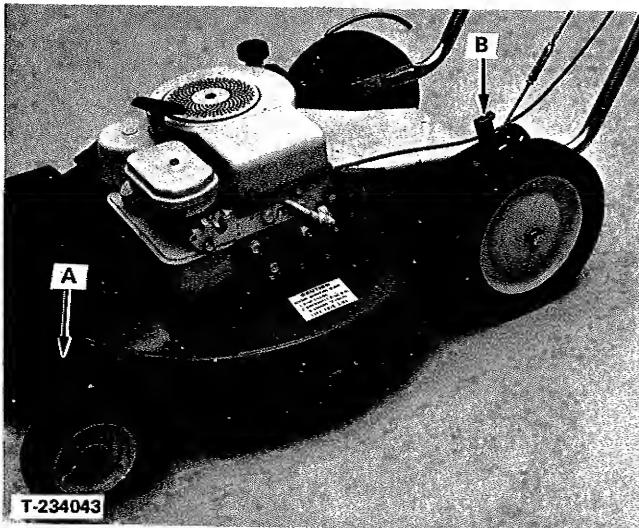


FIGURE 16 - HEIGHT ADJUSTMENT

- A. Spring Tab
- B. Rear Adjuster Arm

MOWER HEIGHT ADJUSTMENT

The front wheels are individually adjusted moving the spring tabs (A, Figure 16) to the desired height. Both rear wheels are adjusted by moving the rear adjuster arm (B) up or down. Be sure to place both spring tabs and the rear adjuster arm in corresponding notches to keep the mower level.

BELT ADJUSTMENT (SELF-PROPELLED MODELS ONLY)

WARNING: Be careful when working in the area of the belt drive if the engine has been running. The muffler gets very hot and can cause injury.

1. Two forward mowing speeds are available by adjusting the drive belt in two different pulley positions. To change speed, proceed as follows:
2. Move spring loaded idler arm (A, Figure 17) forward towards the engine to release tension on the belt (B).
3. Grasp belt with fingers to pull slack toward the double groove pulley. The large groove (C) is for slow forward speed and the small groove (D) is for a faster forward speed.
4. Slowly release spring loaded idler arm to tighten the belt.

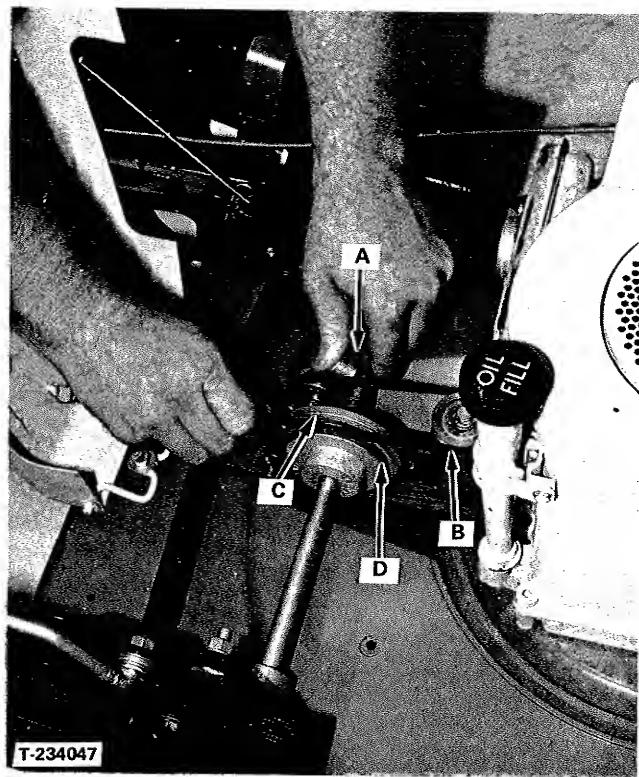


FIGURE 17 - BELT ADJUSTMENT

- A. Spring Loaded Idler Arm
- B. Belt
- C. Large Groove
- D. Small Groove

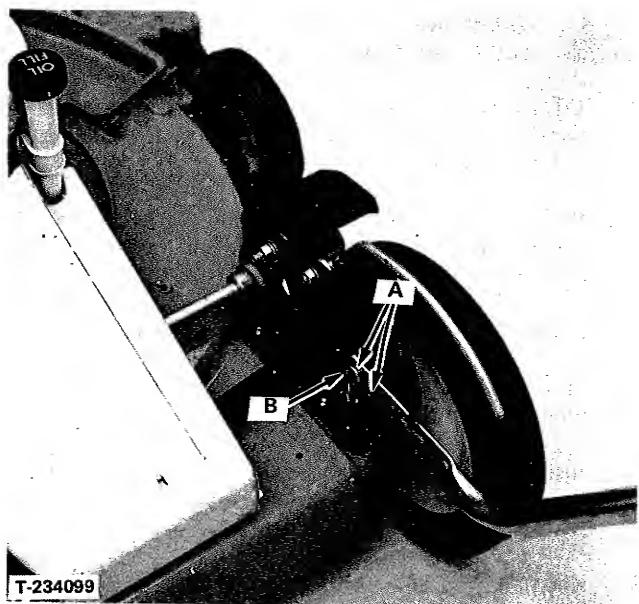
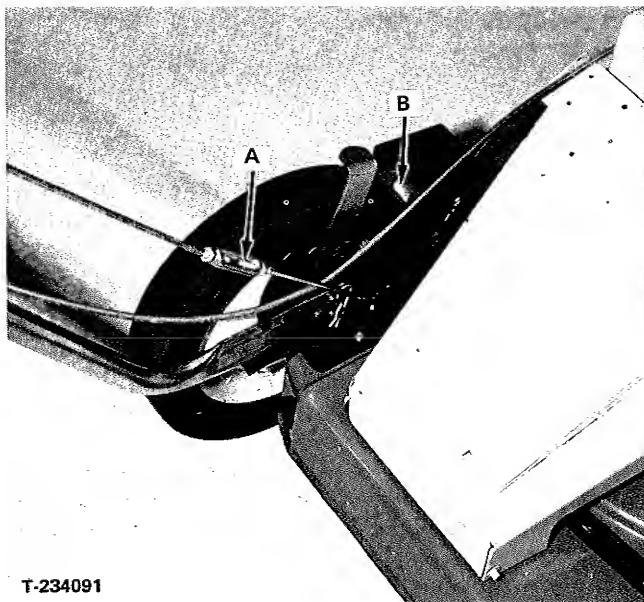


FIGURE 18 - HANDLE HEIGHT ADJUSTMENT

- A. Adjustment Holes
- B. Pin

NOTE: Be sure belt is seated in the pulley grooves and belt is twisted properly. See the belt pattern shown in Figure 15.



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FIGURE 19 - DRIVE MECHANISM ADJUSTMENT

A. Turnbuckle B. Left Drive Roller

HANDLE HEIGHT ADJUSTMENT

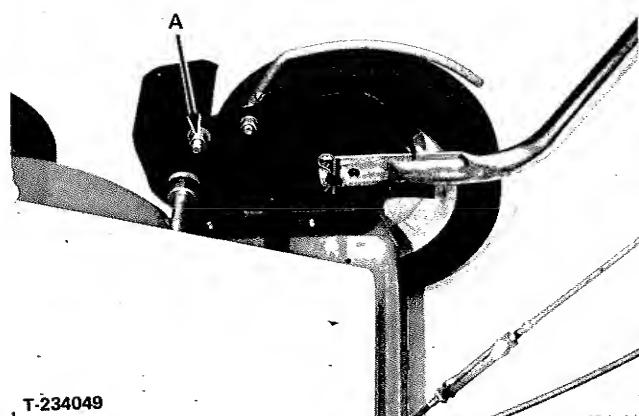
WARNING: For your safety, after changing handle height you must readjust the mower drive mechanism or the mower drive may not disengage.

Each end of the handle has three holes. By placing the retaining pins (B, Figure 18) thru the front holes, the handle will be higher. By placing the retaining pins in the rear holes, the handle will be lower. Do not use the lower holes. Secure the pins with spring clips. Be sure to install the two pins in corresponding holes.

**DRIVE MECHANISM ADJUSTMENT –
(SELF-PROPELLED MODELS ONLY)**

Adjustment of the mower drive is required when:

1. Handle bar height is changed.
2. One or both of the drive wheels slip when the control bar is fully engaged.

**FIGURE 20 - DRIVE MECHANISM ADJUSTMENT**

A. Right Bellcrank Pivot Nut

To adjust, proceed as follows.

1. Loosen the two nuts on the turnbuckle (A, Figure 19).
2. Adjust turnbuckle so there is 1/16 inch (1.6 mm) clearance between left hand drive roller (B) and the tire.
3. Hold the turnbuckle from turning and tighten the nuts.
4. Loosen right hand bellcrank pivot nut (A, Figure 20).
5. Position right hand drive roller so there is 1/16 inch (1.6 mm) clearance between roller and tire.
6. Tighten the bellcrank pivot nut.
7. Recheck clearance on both drive wheels. Repeat above steps if required.

**OPERATING AND MAINTENANCE
INSTRUCTIONS FOR
ENGINE MODELS
MODEL NO. 92908
92998**

WARNING: In the Interest of Safety: Do not run engine at excessive speeds. Operating an engine at excessive speeds increases the hazard of personal injury. Do not tamper with parts which may increase the governed speed.

For rotary lawn mower safety, A.N.S.I. Standard Safety Specifications for Power Lawn Mowers specify a maximum blade tip speed of 19,000 feet per minute (96.5 metres) per second), primarily to reduce the hazard from thrown objects.

Rotary lawn mower manufacturers select the governed top speed of the engine based on the length and design of the cutter blade and design of other mower parts.

All rotary lawn mowers should be checked for conformance to the A.N.S.I. Standard Safety Specifications for Power Lawn Mowers on blade tip speed, if the engine is repaired or replaced, or if mower parts are changed.

DANGER: GASOLINE VAPOR IS HIGHLY FLAMMABLE. Refuel outdoors preferably, or only in well ventilated areas.

CAUTION: DO NOT STORE, SPILL OR USE GASOLINE NEAR AN OPEN FLAME or devices such as a stove, furnace, water heater which utilize a pilot light, or devices that can create a spark.

If gasoline is accidentally spilled, move machine away from area of spill and avoid creating any source of ignition until gasoline vapors have dissipated.

CAUTION: DO NOT REFUEL GASOLINE TANK WHILE ENGINE IS RUNNING.

CAUTION: DO NOT RUN THE ENGINE IN AN ENCLOSED AREA. Exhaust gases contain carbon monoxide, an odorless and deadly poison.

CAUTION: TO PREVENT ACCIDENTAL STARTING always remove the spark plugs from the engine, before working on the engine or equipment driven by the engine.

Except for adjustment; DO NOT operate engine if air cleaner or cover directly over carburetor air intake is removed. Removal of such part could create a fire hazard.

DO NOT OPERATE WITHOUT A MUFFLER OR TAMPER WITH THE EXHAUST SYSTEM. Damaged mufflers or spark arresters could create a fire hazard. Inspect periodically and replace if necessary.

DANGER: ALWAYS KEEP HANDS AND FEET CLEAR OF ROTATING PARTS.

IN THE INTEREST OF ENVIRONMENT

A muffler which leaks because of rust or damage can permit an increased exhaust noise level. Therefore examine the muffler periodically to be sure it is functioning effectively. To purchase a new muffler, see SERVICE AND REPAIR INFORMATION.

WARNING: If this engine is not equipped with a spark arrester and is to be used on any forest covered, brush covered, or grass covered unimproved land, before using on such land a spark arrester must be added to the muffler. The arrester must be maintained in effective working order by the operator. In the State of California the above is required by law. (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. See your Authorized Briggs & Stratton Service Center for spark arrester muffler options.

SERVICE & REPAIR INFORMATION

If service or repair is needed, contact an Authorized Briggs & Stratton Service Center. To serve you promptly and efficiently, the Service Center will need the model, type and code number on your engine.

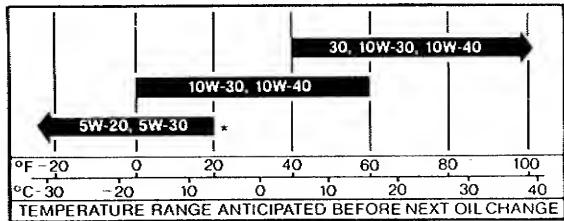
Each Authorized Service Center carries a stock of original Briggs & Stratton repair parts and is equipped with special service tools. Trained mechanics assure expert repair service on all Briggs & Stratton engines.

Major engine repairs should not be attempted unless you have the proper tools and a thorough knowledge of internal combustion engine repair procedure.

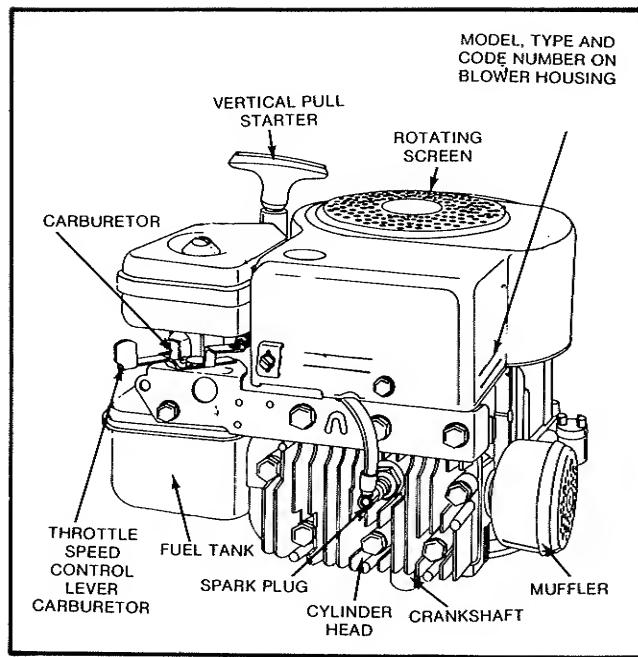
Your nearest service center is listed in the "Yellow Pages" under "Engines, Gasoline" or "Gasoline Engines". He is one of over 25,000 authorized dealers available to serve you.

BEFORE STARTING**READ THE OPERATING INSTRUCTIONS OF
THE EQUIPMENT THIS ENGINE POWERS**

Use a high quality detergent oil classified "For Service SC, SD, SE or MS." Detergent oils keep the engine cleaner and retard the formation of gum and varnish deposits. Nothing should be added to the recommended oil.

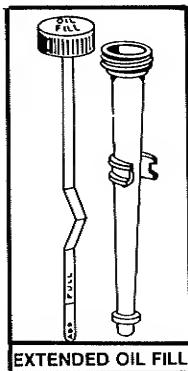
RECOMMENDED SAE VISCOSITY GRADES

* If not available, a synthetic oil may be used having 5W-20, 5W-30 or 5W-40 viscosity.

**TO FILL SUMP WITH OIL**

Place engine on level surface. Clean area around oil fill before removing oil, dipstick.

EXTENDED OIL FILL. Remove cap and dipstick. **FILL TO FULL MARK** on dipstick, **POUR SLOWLY**. Capacity 1-1/4 pints (0.6 liters). When checking oil level screw dipstick assembly firmly but slowly until cap bottoms on tube. **DO NOT OVERFILL.** Dipstick assembly must be securely assembled into tube at all times when engine is operating.

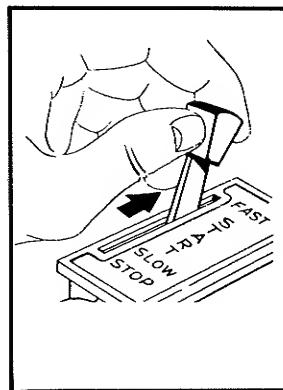
**FILL FUEL TANK**

Use clean, fresh, "regular, low-lead or lead-free" grade gasoline. DO NOT MIX OIL WITH GASOLINE.

STARTING

Start, store and fuel engine in a level position.

GOVERNOR SPEED CONTROL LEVER: Move governor speed control lever to "RUN" or "FAST" position.



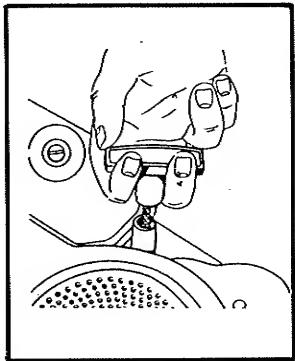
ENGINE

TO START ENGINE



DANGER: Always keep hands and feet clear of mower blade or other rotating machinery.

Rewind Starter. Grasp starter grip as illustrated and pull out cord rapidly to overcome compression and prevent kickback. Return starter grip slowly. Repeat if necessary.

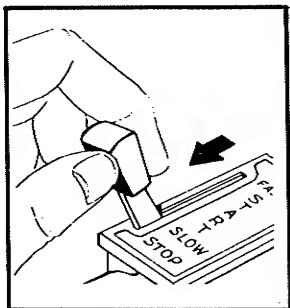


IMPORTANT- This engine features a unique Automatic Choke. In case of flooding, move control to "STOP" and pull starter six times. Then move control to "FAST" position and start engine. If engine continues to flood, rotate the carburetor needle valve 1/8 turn clockwise to obtain a leaner mixture. (See Adjustments).

If the engine does not start easily, when cold, rotate the needle valve 1/8 turn counterclockwise (richer mixture).

TO STOP ENGINE

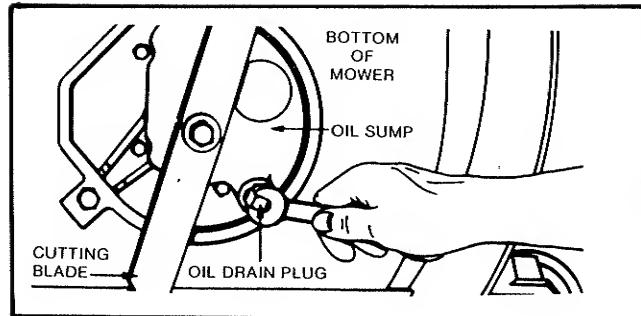
Move engine governor speed control lever to "STOP" Position.



MAINTENANCE

CHECK OIL LEVEL regularly — after each five hours of operation. BE SURE OIL LEVEL IS MAINTAINED.

CHANGE OIL after first five hours of operation. Thereafter change every 25 hours of operation. Change oil while engine is warm. Oil may be drained thru oil drain on bottom of engine. To drain completely, always place engine level when draining thru the bottom.



TO SERVICE AIR CLEANER

Clean and re-oil foam element at three month intervals or every 25 hours, whichever occurs first.

NOTE: Service more often under dusty conditions.

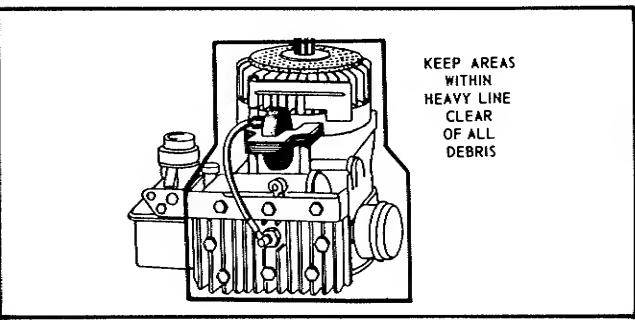
OIL FOAM AIR CLEANER

1. Remove screw.
2. Remove air cleaner carefully to prevent dirt from entering carburetor.
3. Take air cleaner apart and clean.
 - a. WASH foam element in a liquid detergent and water to remove dirt.
 - b. Wrap foam in cloth and squeeze dry.
 - c. Saturate foam with engine oil. Squeeze to remove excess oil.
4. Reassemble parts and fasten to carburetor.



ENGINE

CLEAN COOLING SYSTEM — Grass, chaff or dirt may clog the rotating screen and the air cooling system, especially after prolonged service cutting dry grasses. Yearly or every 100 hours, whichever occurs first, remove the blower housing and clean the areas shown to avoid overspeeding, overheating and engine damage. Clean more often as necessary.

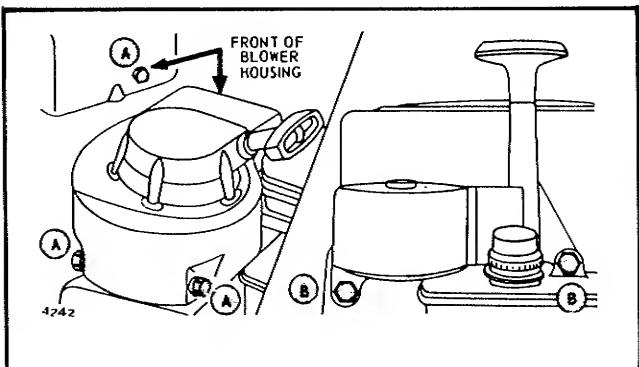


DANGER: Periodically clean muffler area to remove all grass, dirt and combustible debris.

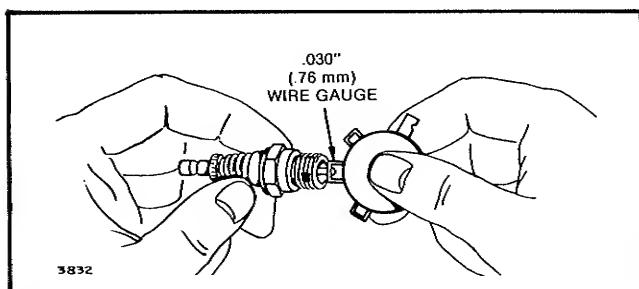
TO REMOVE THE BLOWER HOUSING

To remove the blower housing on Rewind Starter Models—remove three screws labeled "A". Lift housing to remove.

On Vertical Pull — First remove two screws "B" used to attach starter to engine. Then remove three screws "A". Lift housing to remove.



SPARK PLUG — Clean and reset gap at .030" (0.76 mm) every 100 hours of operation.



IMPORTANT: Do not blast clean spark plug. Spark plug should be cleaned by scraping or wire brushing and washing with a commercial solvent.

Sparking can occur if wire terminal does not fit firmly on spark plug, or if stop switch vibrates against spark plug. Reform terminal or repair switch if necessary.

REMOVE COMBUSTION DEPOSITS every 100-300 hours of operation. Remove cylinder head and cylinder head shield. Scrape and wire brush the combustion deposits from cylinder, cylinder head, top of piston and around valves. Use a soft brush to remove deposits. Re-assemble gasket, cylinder head and cylinder head shield. Turn screws down finger tight. Torque cylinder head screws in a staggered sequence to 140 inch pounds (15.82 N·m).

SPARK ARRESTER EQUIPPED MUFFLER — If engine muffler is equipped with spark arrester screen assembly, remove every 50 hours for cleaning and inspection. Replace if damaged.

ADJUSTMENTS

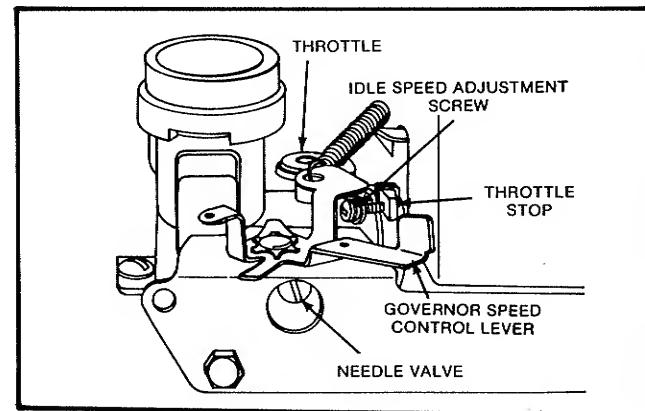
CARBURETOR ADJUSTMENTS

Minor carburetor adjustment may be required to compensate for differences in fuel, temperature, altitude or load.

TO ADJUST CARBURETOR — Turn needle valve clockwise until it just closes.

NOTE: Valve may be damaged by turning it too far.

Now open needle valve 1-1/2 turns counterclockwise. This initial adjustment will permit the engine to be started and warmed up prior to final adjustment.



NOTE: All carburetor adjustments should be made with the air cleaner on engine. Air cleaner mounting screw MUST be in carburetor when engine is run. Best adjustment is made with a fuel tank half full of gasoline.

ENGINE

FINAL ADJUSTMENT

Place governor speed control lever in "FAST" position. Turn needle valve in until engine misses (clockwise — lean mixture) then turn it out past smooth operating point until engine runs unevenly (rich mixture). Now turn needle valve to the mid-point between rich and lean so the engine runs smoothly. Next, adjust idle RPM. Rotate throttle counterclockwise and hold against stop. Adjust idle speed adjusting screw to obtain 1750 RPM. Release throttle — engine should accelerate without hesitation or sputtering. If engine does not accelerate properly, the carburetor should be re-adjusted, usually to a slightly richer mixture.

CONTROL ADJUSTMENTS

The remote control must be properly adjusted to stop and to operate the engine at maximum speed.

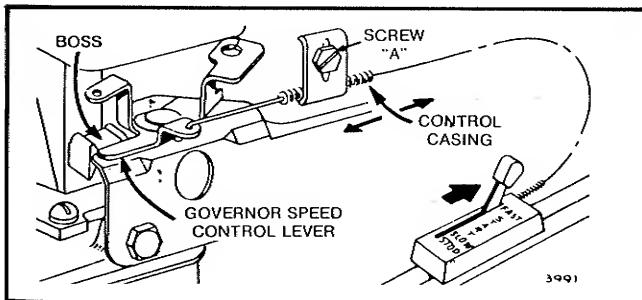
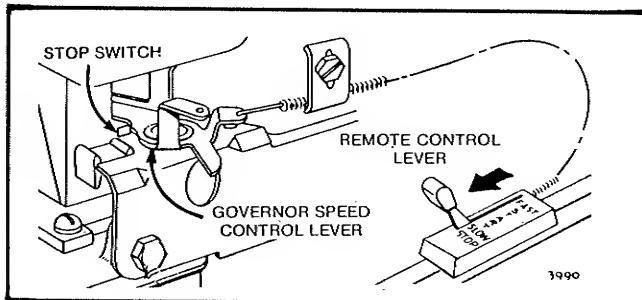
The acceptable engine operating speed range is 1800 to 3600 RPM.

Idle speed is 1750 RPM. The manufacturer of the equipment on which the engine is used, specifies the top governed no load speed at which the engine may be operated, DO NOT EXCEED this speed.

To Check Operation:

Move the remote control lever to STOP position. The governor speed control lever should fully contact the stop switch as shown.

With the remote control lever in FAST position, the governor speed control lever should just touch the boss as shown.



To Adjust Remote Control:

1. Loosen casing clamp screw "A".
2. Place remote control lever in FAST position.
3. Move control casing forward or backward until governor speed control lever just touches boss as shown.
4. Retighten screw "A".

GENERAL INFORMATION

These engines are single-cylinder, L-head, air-cooled type.

MODELS 92908 & 92998

Bore	2-9/16" (65.09 mm)
Stroke	1-3/4" (44.45 mm)
Displacement	9.02 cu. in. (147.8cc)
Horsepower Max.	3.5 @ 3600 RPM
Torque (Ft. Lbs.) Max.	5.26 @ 3100 RPM

The horsepower ratings listed above are established in accordance with the Society of Automotive Engineers Test Code-J607. For practical operation, the horsepower loading should not exceed 85% of these ratings. Engine power will decrease 3-1/2% for each 1,000 feet (304.8 m) above seal level and 1% for each 10° above 60° F (16° C).

In some areas, local law requires the use of a resistor spark plug so as to suppress ignition signals. If an engine was originally equipped with a resistor spark plug, be sure to use the same type of spark plug for replacement.

TUNE-UP SPECIFICATIONS

Spark Plug Type	Champion	Autolite	Robert Bosch
Short Plug	CJ-8	235	WS9E
Long Plug	J-8	295	—
Resistor Short Plug	RCJ-8	245	WSR9E
Resistor Long Plug	RJ-8	306	—

Spark Plug Gap030" (0.76 mm)
Ignition Point Gap020" (0.51 mm)
Intake Valve Clearance005" - .007" (0.13-0.18 mm)
Exhaust Valve Clearance009" - .011" (0.23-0.28 mm)

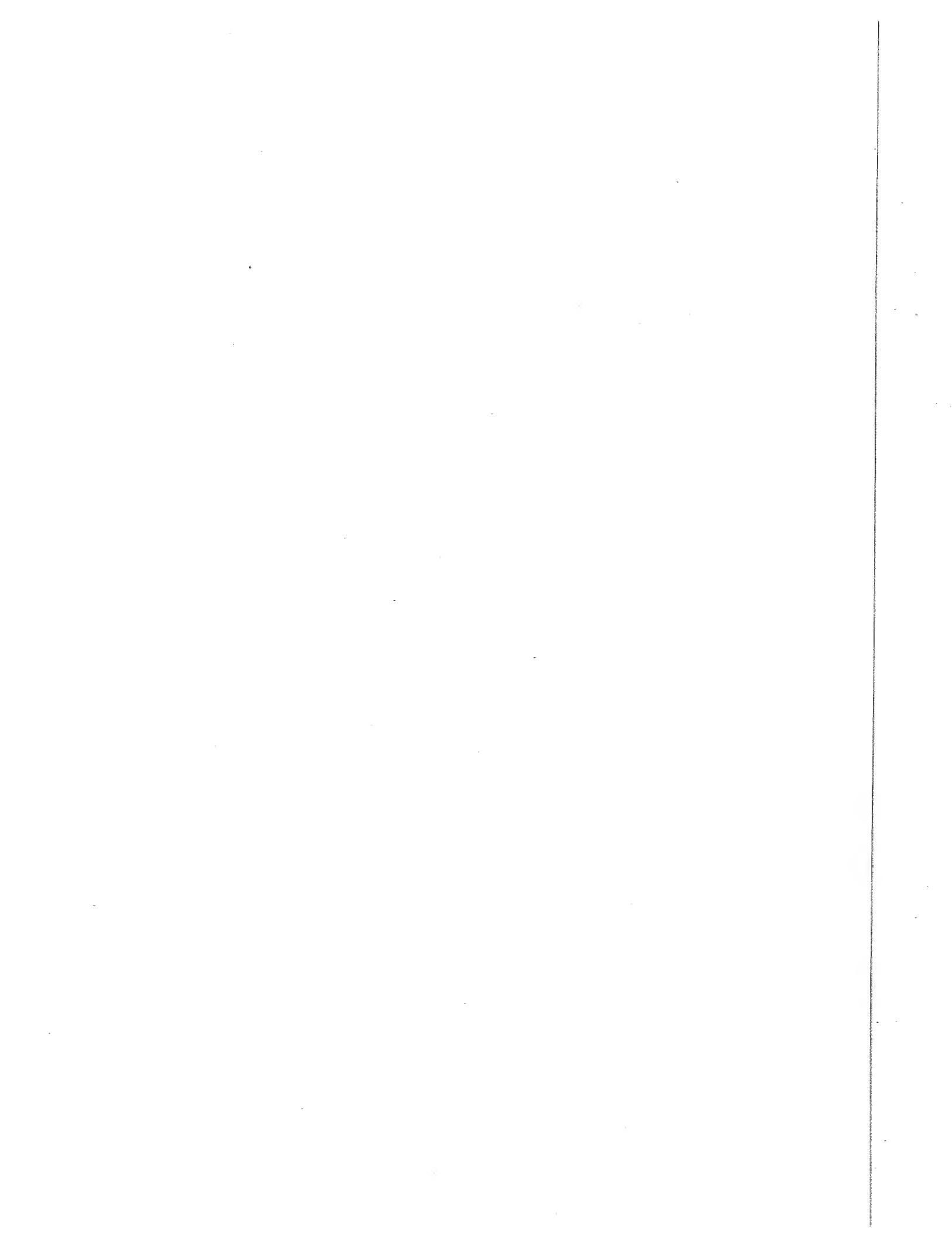
STORAGE INSTRUCTIONS

Engines to be stored over 30 days should be completely drained of fuel to prevent gum deposits forming on essential carburetor parts, fuel filter and tank.

The use of a fuel additive, such as STA-BIL, or an equivalent, will minimize the formation of fuel gum deposits during storage. Such an additive may be added to the gasoline in the fuel tank of the engine, or to the gasoline in a storage container.

- a. All fuel should be removed from the tank. Run the engine until it stops from lack of fuel. The small amount of fuel that remains in the sump of the tank should be removed by absorbing it with a clean, dry cloth.
- b. While engine is still warm, drain oil from crankcase. Refill with fresh oil.
- c. Remove spark plug, pour one ounce (29.6 cc) of engine oil into cylinder and crank slowly to distribute oil. Replace spark plug.
- d. Clean dirt and chaff from cylinder, cylinder head fins, blower housing rotating screen, and muffler areas.
- e. Store in a clean and dry area.





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